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ASSESSMENT OF BROILER PRODUCTION IN OBIO/AKPOR LOCAL GOVERNMENT AREA, RIVERS STATE, NIGERIA.

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Abstract

This study was conducted to assess the production of broiler birds in Obio/Akpor Local Government Area of Rivers State, Nigeria. A total of 60 broiler farmers were randomly selected in the study area. Data were collected using well-structured questionnaire and personal interview. Descriptive statistics, enterprise budget and multiple regression models were used to analyse the data. The result showed that males dominated the broiler business with 62.3% with average age of 41.4 years, average household size was 5 persons, majority of the respondents were able to obtain tertiary education (61.67%). The result also shows that farmers made an average net profit of N974, 280.58 per production cycle. The result of the regression analysis shows that cost of feed negatively influenced the amount of revenue realized and was significant at 1% while farm size and years of experience positively influenced the farmers' revenue at 5% significance level. Double log model was chosen as the lead equation because it showed the highest R-squared ratio of 0.7615. This means that the explanatory variables included in the model were able to explain about 76% variation in the revenue of broiler production in the study area. Major constraints in broiler production include; high cost of feed, high cost of day old chicks, inadequate extension services and inadequate funds. It is recommended that farmers should include non-conventional feed in feeding the birds in order to reduce the cost of feeding.

Keywords: Broiler, Production, Economics, Rivers State.

Introduction

Broilers are table birds with developed strains with faster growth rate and they have a larger body frame and weight (Beutler, 2007). The production is mainly for the purpose of meat supply. The importance of broiler production cannot be overemphasized, apart from making meat available within a very short period of time (10-12 weeks), it is also essential for the provision of nutrients needed for growth and tissue replacement. It is also a major source of animal protein supply with high biological value needed for the optimum health of man; provision of job opportunities for the unemployed as well as a source of revenue to investors. He stressed that the potential of poultry in reversing inadequate protein intake in Nigeria has been recognized. Comparing to other livestock, poultry has the advantage of fast growth rate and efficiency in feeds conversion. Thus if and when appropriately managed and the right feeding administered, broilers can mature at 10-12 weeks at a target live weight of 1.8 - 2.0kg.

Broiler industry therefore is the best integrated one in the whole of poultry production industry. It can therefore, be relied upon for quick amelioration of deficit protein supply (Nwajiuba, 1998, Agbakoba, *et al.* 1995). Oluyemi and Roberts (2000) and Isika *et al.* (2006) postulated that poultry was strategic in addressing animal protein intake shortage in human nutrition because of its high fecundity, fast growth rate, short generation interval and unparalleled competence in nutrient transformation to high quality animal protein. The industry has a significant effect on national economy. A report by Okonkwo and Akubo (2001) show that about ten (10) percent of Nigerian population engaged in poultry production are mostly on subsistence and small or medium - sized farms.

Poultry production in addition contributes to the nation's gross domestic product (GDP), it provides gainful employment and income to sizeable proportion of the populace (Rahman and Yakubu, 2005).

Broilers can be raised extensively or intensively but for better yield and commercial purposes the intensive system of management is recommended, where birds are kept in confined area usually cemented (Ironkwe and Amaefule, 2008). Henning *et al* (2007) pointed out that 84 percent of the total population of broilers in most communities in Nigeria is kept under the scavenging system of production while only 12 percent are kept in the intensive system of production.

Statement of Problem

The challenges of food insecurity and hunger particularly in a developing country like Nigeria have remained problems that demand serious attention. Ojo (2003) revealed that in spite of the numerous human and natural resources in Nigeria, the country still remains among the least consumers of animal protein in Africa. Also, protein intake of an average Nigerian is about 53.8% with only 6.0 to 8.4 g/head/day of animal origin. The studies further revealed that North America, Western and Eastern countries consume 66, 39 and 33 of animal protein per head per day, while an average Nigerian consumes 7.5g which is below the recommended level of 27 g/head/day. To increase protein intake in Nigeria, it therefore calls for urgent need to increase broiler production at both household and commercial holdings.

In Nigeria, animal protein, especially meat is expensive and in short supply and is out of reach to majority of the population. The effect of inadequate protein intake is felt more by a large proportion of the population especially in rural areas (Chukwuji, *et al* 2006). Due to increase in population and high demand for animal protein, different sources of animal production has been developed and one of which is poultry (broiler production) which is presently exploited to meet the protein needs of the people.

Broiler production in Rivers State is still very discouraging, as cost of feed alone constitutes about 70-80 percent of the total cost of production (Ironkwe and Amaefule, 2008). This high cost of feed and improper system of management could be among the causes of many failures in poultry industries. Nigerians, therefore have continued to experience increasing animal protein deficiency because of low productive capacity of the poultry industries. This is a major contributory factor to the incidence of high rate of infant mortality. Several questions have been raised with respect to the state of poultry industry in Nigeria, especially in Rivers State. Questions like; are broiler farmers making reasonable return (benefits) considering the rising cost of production? Secondly, if the returns are high, in view of the high prices of broiler birds, why are farmers not increasing their scale of production? What are the cost and returns of broiler production in the study area? Are there any major constraints faced by broiler producers in the area? It is on this background that this study is developed to assess the production of broiler birds in Obio/Akpor Local Government Area of Rivers State.

Objectives of the Study

The general objective of this study is to assess broiler production in Obio/Akpor Local Government Area in Rivers State. The specific objectives were to;

- i. examine the socio-economic characteristics of broiler producers in the study area.
- ii. estimate cost and return of broiler production in the study area.
- iii. evaluate the determinants of gross revenue in broiler production in the study area.
- iv. identify the major constraints of broiler production in Obio/Akpor Local Government Area of Rivers State.

Literature Review

Broiler production involves the keeping of chickens of heavy meat breeds for the purpose of getting good quality meat products, usually sold alive or processed at ten to twelve weeks of age (Amos, 2006). Broiler production is carried out in all parts of the country with no known religious, social or cultural inhibitions associated with their consumption. Specifically, investment in broiler enterprise is attractive because the production cost per unit is low relative to other types of livestock, poultry meat is very tender and broiler enterprises have short production cycles (Nwajiuba and Nwoke, 2000). The high demand for poultry products, the success of exotic breeds and the ease of mastering the techniques of poultry production among other factors have made it developed to the status of agribusiness in Nigeria as distinct from subsistence production (Nwajiuba and Nwoke, 2000; Sani, *et al.*, 2000). A contrary view by International Fund for Agricultural Development, (2001) states that broiler production is not promising, hence total returns are very low that would not attract high rate of investment.

Higher feed costs suggest an earlier marketing weight to obtain a large profit margin, although high feed cost combined with high initial costs (for housing and chicks) require that the chicks be sold later to spread this cost over more kilograms of meat. In some cases, the preference is for older and bigger birds, especially at Christmas (Oluyemi and Roberts, 2000). Other studies by Adepoju (1999), Hassan (2002) and Adebayo and Adeola (2005) revealed that, socio-economic factors affecting poultry production in Nigeria cut across age, educational level, input, access to extension services, access to veterinary services, finance, labour, infrastructure and government policy. Adebayo and Adeola, (2005) reported that

educational level of producers had positive and significant relationship with average production (Y) while age had negative and non-significant relationship with the average production. They attributed the significant relationship between educational level and average production to high need of sound knowledge and efficient management of poultry business to ensure high output and profitability in the business. They also explained that finance and inputs had significant relationship with average production of the respondents. This according to them was attributed to the fact that only few producers had access to credit facilities or loan from financial institutions.

Marketing of broiler products was the main problem (37%) affecting broiler production in the study area (Emaikwu, *et al.* 2011). This was a critical determinant of broiler flock size during the two production cycles of Easter and Christmas in the area. The least (4%) problem factor was drug and vaccine failure. Other factors include high feed cost and irregular feed supply (25%), high cost of Day-Old-Chicks (23%), inadequate capital (12%) and inadequate extension services (11%) respectively.

Broilers production has been on the decline over the years and is due to several factors (Fisseha, 2009). He listed the following as the factors responsible for the decline: high cost of feed, high cost of day old chicks, high disease incidences, high cost of medication and packaging in large quantities which is unfavorable for farmers with small numbers of birds, marketing strategies, climate change, management factors and high cost of transportation e.t.c. He emphasized that marketing is a constraint in broiler production; even though broiler meat is relatively cheap and affordable, lack of organized marketing system and the seasonal fluctuation of prices are the main constraints of broiler marketing.

Methodology

Study Area: The study was carried out in Obio/Akpor Local Government Area of Rivers State. It is one of the 23 Local Government Areas in Rivers State in the metropolis of Port Harcourt. It was created on the 3rd of May, 1989 out of the old Port Harcourt Local Government Area of Rivers State. It is a major centre of economic activities in Nigeria, and covers about 260 square kilometre. The population of the people was 462,350 persons at 2006 census (NPC,2006). The local government area is made up 53 communities which are constituted mainly by people of Ikwerre ethnic nationally with four prominent kingdoms which are Akpor, Apará, Evo/Oroputuma and Rumueme clans. Obio/Akpor has a total land mass of approximately 311.71 square kilometres and shares boundaries with Emuoha LGA, Ikwerre LGA , Etche LGA , Oyigbo LGA , Eleme LGA, Okirika LGA and Port Harcourt City LGA.

The Local Government Area is rich with natural resources such as oil and gas, clay, sand, and gravel. The primary occupation of people includes farming, fishing and hunting. Farm crops produced include cassava, yam, cocoyam, okra, pepper, fluted pumpkin, melon, cowpea, maize, potatoes, and banana to mention but a few. Others are cash crops like oil palm trees; rubber and cashew are also grown. Farming is done mostly at subsistence level for generation of household income to take care of other needs of the family, such as building of family shelter, buying of clothes and payment health care services and schools fees. The people also engage in livestock production/ animal husbandry (Obio/Akpor, 2009).

Sampling Procedure and Sample Size

Random sampling technique was used in the selection of broiler farms for the study. Ten (10) communities were randomly selected from the study area. The communities included; Rumuodomuaya, Eneka, Rumuekini, Rumuosi, Alakahia, Nkpolu- Rumuigbo, Choba, Rumuokparali, Rukpokwu andRumuokoro. 60 farmers were randomly selected from the communities in the study area.

Sources of Data Collection: Primary source of data was collected from field survey while the secondary data was collected from journals, textbooks, internet and publications, complemented the primary data collected.

Techniques for Data Analysis: Objectives 1 and 4 were obtained using descriptive statistical tools like frequency, mean and percentages. The second objective was estimated using Net Profit Model analysis and Objective 3 which was the major determinants of gross revenue in broiler production was analyzed using multiple regression models:

Model Specification: The models used to analyse data collected are listed below:

Net Profit Model: Farm budgeting model was constructed to determine the profitability of broiler production. This is the difference between the gross revenue and total cost of production. Total cost of production is the total expenses incurred during the production period. It includes variable and fixed costs. It is expressed as:

$$NP = TR - TC$$

Where

NP = Net Profit,

TR = Total Revenue,

TC = Total Cost of Production i.e.

Fixed Cost + Variable Cost.

$$TC = TVC + TFC$$

Where;

TC = Total cost of broiler produced in naira TVC = Total variable cost incurred in naira by broiler producers in the study area, include the following: Cost of day old chicks (₦), cost of feed (₦), cost of medication (₦), cost of energy (₦) and cost of transport(₦).TFC = Total fixed cost incurred by broiler producers, include the depreciation value of the following: building in (₦), drinkers in (₦), feeders in (₦), shovel in (₦), broom in (₦) wheelbarrow in (₦).

$$\text{Total Revenue (TR)} = P (\text{₦}) \times Q (\text{Kg})$$

Where P = Price of broiler per kg Q = Quantity of broilers produced GM = TR - TVC

Where GM= Gross Margin TR= Gross Revenue TVC= Total Variable Cost NP = GR- TC

Where NP = Net Profit in naira

3.4.2 Multiple Regression Model

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6 + e)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

Where; Y = Gross revenue realized in naira

x_1 = Cost of feed in naira

X_2 = Cost of medication in naira

x_3 = Cost of energy in naira

x_4 = Level of education in years

x_5 = Farm size in number of birds

x_6 = Years of experience in number

e = Random term

The three (3) functional forms used include the following

Linear

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

Semi-Log

$$\text{Log } Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

Double Log

$$\text{Log } Y = \beta_0 + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + \beta_5 \log X_5 + \beta_6 \log X_6 + e$$

Where;

$x_1 - x_6$ = Independent variables
 $\beta_1 - \beta_6$ = Regression coefficient
 β_0 = Constant
 e = Error term

Results and Discussion

The result on Table 1 shows that the minimum age of the broiler farmers was 30 years, the maximum age was 51 years and the average age was found to be 41 years. This is consistent with the findings of Amos, (2006) who found that the mean age for layer and broiler farmers was 41.3 and 44.7 years respectively. The average number of years a farmer spent in broiler production was estimated 6.7 years. This indicates that most of the farmers in the study area are experienced in broiler production. Average years of 6.7 in broiler production may have contributed to the level of profits recorded by the respondents in the study area. The average household size of the farmers was 5 persons and the estimated average number of birds reared per farmer in the study area was 994 birds

The result on Table 2 shows that most of the farmers (61.67) percent had tertiary education, 32.8 percent had secondary education, while only 1.6 percent of the farmers acquired primary education and 3.3 percent of the farmers had no formal education. This means that broiler farmers could understand and apply new innovation techniques to enhance broiler production in the study area.

The result on the marital status of the farmers indicated that 85% of broiler producers in the study area were married, 8.3% of them were single while 6.7% of the farmers in the study area were either separated or divorced. The findings on the marital status of the respondent is consistent with the findings of Amos, 2006 which reported that majority of the respondents (78.3 % and 73.9 for layers and broiler producers respectively in Ondo State, Nigeria were married. It was also found that 63.3 percent of the respondents were males, while 36.7 percent of them were females. This indicates that males dominated the broiler production business in the study area. This is in agreement with the findings of Amos, 2006 who found that majority of the poultry farmers in Ondo State were males ie. (73.9 % and 78.36% for layer and broiler producers respectively).

The result of type of the housing system adopted in the production of broiler in the study area shows that 96.7 percent of the respondents practiced the deep litter system of broiler management while only 3.3 percent of them practiced the free range system of broiler management. The predominant system of poultry housing in the study area may be responsible for the profit level recorded among farmers in the study area among others.

The result of the profitability level of broiler farmers is shown in Table 3

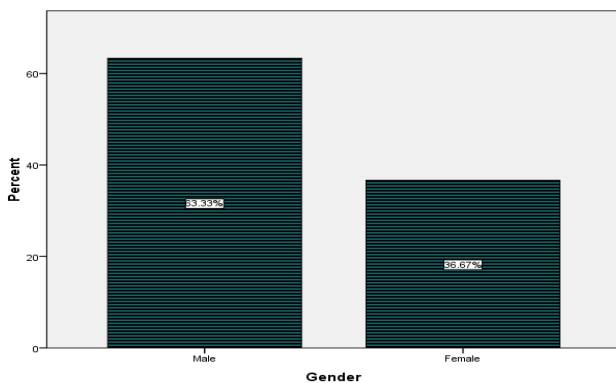


Figure 1 bar chart showing the sex distribution of broiler producers in the study area.

The result on Table 3 shows that gross revenue realized by the broiler farmers was estimated as N1,390,537.50, total variable cost (TVC) was estimated as N407, 716.92 while gross margin was estimated as N982, 820.58 for a production cycle. This means that broiler producers in the study area made profit even though the cost of production was considerably high. Net Profit was estimated as N974,280.58 which shows that broiler production is a lucrative and profitable business.

The result of the regression analysis on determinants of gross revenue in broiler production is presented on Table 4.

Table 4 shows the result of the regression analysis; three functional forms (linear, semi-log and double log forms) were used. Double logarithm model was chosen as the lead equation because it showed the highest R-squared ratio of 76%. The estimated coefficients; cost of feed, farm size and years of experience were the major determinants of revenue in broiler production in the study area. The estimated R^2 of 0.76 implies that about 76% of the variation in the revenue of broiler production was explained by the explanatory variables included in the model. Cost of feed was negative and significant at 5% level, which implies that the higher the quantity of feed purchased, the higher the cost of feed which will eventually reduce the net income of broiler production in the study area. This is in agreement with the studies by Adesimi, (1988) and Emenyonu, *et al.* (2005) on cost of feed in poultry production but it is contrary to the study of Amos, 2006 that showed that cost of feed was positive and significantly influenced poultry production which implies that the higher the quantity of feed, the higher the revenue from broiler production.

Farm size experience of the farmers and years of the farmers positively influenced the level of revenue realized by broiler farmers at 10% and 5% levels of significance respectively. The positive sign of farm size implies that the more the number of birds raised, the higher the revenue earned by the respondents. The positive sign of the coefficient years of experience implies that the more number of years an individual is involved in broiler production, the more experienced he would likely be in the production activities of broiler birds. This would likely improve the skills of the farmers in broiler farming. Skillful ability in broiler farming would likely result to higher revenue earning and subsequently higher profit *ceteris paribus*. Cost of medication, educational level of the farmers and cost of energy were not significant determinants of profit level in broiler production in the study area.

The result on Table 5 shows the constraints of broiler production in the study area. The farmers identified high cost of day old chicks as a major problem of broiler production in the study area. 73.3 percent of the respondents accepted that high cost of day old chick constituted a problem in broiler production. This may be responsible for the type and breed of day old chicks purchased by the farmers. Broiler farmers preferred the purchase of the day old chicks which are less expensive in order to reduce cost on day old chicks (e.g. Anak, Harco breeds) is preferred to more costly breeds (e.g. Hubbard). Farmers also complained of high cost of transportation, which results in difficulty to obtain healthy and disease free stock, as well as getting supply at the required time. They also complained of high mortality rate of day old chick at the point of delivery to the farm, thus resulting reduction their expected returns.

The study further reveals that high cost of feed constituted a problem in broiler production in the study area. It was found that 78.3 percent of the respondents indicated that continuous increase in the cost of feed was a major determinant of the size of poultry farm operated in the study area. Few farmers (38.3) percent pointed out that problem of poultry diseases such as coccidiosis, fowl pox, chronic respiratory diseases, newcastle disease and fowl cholera were identified as the commonest ones in the farms. The infestation of diseases on the birds adds extra cost to total cost of production at the same time cases of severity of diseases causes' loss of birds. The low percentage of this problem could be as a result of the system of broiler birds' management practices adopted by farmers in the study area. Marketing of birds by farmers in the study area was identified as a problem of broiler production although few farmers (33.3 percent) had problems in marketing the product. The problem of market for the product could be as result of irregular supplies and farmers inability to meet up with the daily or weekly demand for organization's (fast food industry) of table broiler birds.

It was also found that about 71.7 percent of the farmers complained of the inadequate extension services for technical advices. This implies that farmers hardly receive technical advice in broiler production from extension services in the study area. Broiler producers also complained of problems of inadequate funds. This problem may have limited most farmers to small scale level of broiler production in the study area. It was found that farmers were not able to access loans from agricultural banks because of strenuous and difficulties in accessing such funds. Prospective broiler producers found it difficult to raise the required amount of capital needed for an effective operation and expansion of their farms.

Conclusion

he study assessed the broiler production in Obio/Akpor Local Government Area of Rivers State. Broiler production is dominated by male farmers (63.3 percent) with average years of experience of 6.7. Despite numerous challenges in broiler production in the study area, the business was profitable showing average net profit of ₦974, 280.58 per production cycle.

Recommendations

Based on the findings from this study, the following recommendations are pertinent”

- Investors in the study area should take advantage of absence of livestock mills in the study area by establishing one to generate income as well as making feeds available for livestock farmers at a reduced cost.
- Large poultry farms in the study area are advised to adopt backwards integration by establishing feed mills, where quality livestock feed would be produced to reduce cost of feed in broiler production.
- Broiler producers are encouraged to form broiler farmer’s co-operatives society to enable them pool their resources together in order to procure inputs, services as well as loan.
- New broiler farmers should endeavour to consult the older farmers for advices on certain skills and procedures in better management of broiler farms.

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Table 1 Result of socioeconomic attributes of broiler farmers

Variable	NO	Min	Max	Mean	SD
Age of farmers(Yrs)	60	30	51	41.35	5.21
Years of experiences	60	1	26	6.73	4.86
Household size	60	0	11	4.63	2.35
Farm size in number of birds	60	60	8500	994.27	1177.80

NO = Number of Observations, Min = Minimum, Max = Maximum, SD =Standard Deviation
Source: field survey, 2011.

Table 2 Result of other socioeconomic attributes of broiler farmers in the study area.

Variables	Frequency	Percent
Sex		
Male	38	63.3
Female	22	36.7
Educational level		
No formal education	2	3.3
Primary education	1	1.7
Secondary education	20	33.33
Tertiary education	37	61.67
Marital status		
Married	51	85
Single	5	8.3
Separated/divorced	4	6.7
Housing System		
Deep Litter System	58	96.7
Free Range System	2	3.3
Total	60	100.0

Source: field survey, 2011.

Table 3: Estimated cost and returns of broiler production in the study area

Items	Mean estimate in naira
Cost of Feed	136,977.75
Day old chicks	189,726.67
Cost of medication	49,801.67
Cost of transport	13,230.83
Cost of energy	17,980.00
Total variable cost	407,716.92
Gross revenue	1,390,537.50
Gross margin	982,820.58
Fixed cost (depreciation of fixed assets)	8,540
Net profit	974,280.58

Source: Field survey, 2011

Table 4. Result of regression analysis of the determinants of gross revenue in broiler production

Linear Model

Items	Coefficient	Standard Error	t	P> t
Constant	22791	236015.7	0.10	0.923
Cost of Feed	-2.187258	0.8149408	-2.68**	0.010
Cost of Medication	1.673939	1.043027	1.60*	0.114
Cost of Energy	-8.871415	2.216864	-3.92**	0.000
Level of Education	31096.84	51057.71	0.61	0.545
Farm Size	971.8389	152.3955	6.38***	0.000
Years of Experience	36059.79	13883.43	2.60**	0.012
R- Squared = 0.7178				
Adjusted R- Squared = 0.6858				

Semi- Logarithm Model

Items	Coefficient	Standard Error	t	P> t
Constant	12.45371	.280423	44.41	0.000
Cost of Feed	-2.38e-06	9.68e-07	-2.46**	0.017
Cost of Medication	1.41e-06	1.24e-06	1.14	0.260
Cost of Energy	-.0000123	2.69e-06	-4.56**	0.000
Level of Education	0.042762	.0606644	0.07	0.944
Farm Size	.0011083	.0001811	6.12***	0.000
Years of Experience	.0467213	.0164957	2.83**	0.007
R- Squared = 0.6694				
Adjusted R- Squared = 0.6319				

Double Logarithm Model

Items	Coefficient	Standard Error	t	P> t
Constant	9.6912303	1.239234	7.82	0.000
Cost of feed	-.330342	.1259796	-2.62**	0.011
Cost of medication	.1275845	.0875779	.46	0.151
Cost of energy	.0156359	.069912	0.22	0.824
Level of education	.0625394	.151119	0.41	0.681
Farm size	.8781039	.1363113	6.44***	0.000
Years of experience	.1792157	.0980522	1.83**	0.73
R- Squared = 0.7615				
Adjusted R- Squared = 0.7346				

* Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level.

Table 5 Constraints of broiler production in the study area

Variables	Frequency	Percent
High cost of day old chicks		
Yes	47	73.3
No	13	26.7
High Cost of Feed		
Yes	44	78.3
No	16	21.7
High Disease Incidence		
Yes	37	38.3
No	23	61.7
Marketing of Birds		
Yes	40	33.3
No	20	66.7
Inadequate extension services		
Yes	43	71.7
No	17	28.3
Inadequate funds		
Yes	37	61.7
No	23	38.3
Total	60	

Source: Field survey, 2011